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Level of antioxidant vitamins in children suffering from pneumonia

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Abstact

Oxidant antioxidant balance is essential for the normal lung function. Both an increased oxidants and/or decreased antioxidants may reverse the physiologic oxidant antioxidant balance in favour of oxidant leading to lung injury. The aim of present study was to examine the levels of vitamin E & C in children who were suffering from pneumonia. 40 pneumonia children and 40 controls matched with age were analyzed for the study. We observed that highly significant decrease in the concentrations of vitamin E & vitamin C was seen in children with pneumonia compared to controls (p<0.001) respectively. Also there was increased ratio of vitamin E & vitamin C in patients with pneumonia as compared to the controls.

Key words: Antioxidants, Vitamin E, Vitamin C, Pneumonia.

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Introduction

The most widespread and fatal of all acute disease, pneumonia is now 'captain of the men of death' [1]. The most common cause of illness in children & one of the most common indications for imaging in children are the respiratory tract infections. Primarily each year an estimated 4 million children in developing countries die from pneumonia [2].

Pneumonia is a serious infection or inflammation in which the air sacs fill with pus and other liquids [3]. Viruses such as influenza virus, respiratory syncytial virus, are responsible for 45% of the episodes of pneumonia identified in hospitalized children in Dallas. But there are several non-infectious causes also, but are not limited to aspiration of food, or gastric acid, foreign bodies, hydrocarbons and lipid substances, hypersensitivity reactions and drugs or radiation induced pneumonitis [4].

Materials and Methods

The present study was conducted on patients from pediatric OPD in the general hospital, Sangli & Government medical college & hospital, Miraj. The age limit in study group ranges from 5 to 15 years. The chest radiograph by the pediatrician confirmed pneumonia. Total of 40 pneumonia patients were included in the study and 40 individuals of the same age limit in the control group. The informed consent was obtained from patient's parents & approved by the ethical committee of institution.

The sample collection of patients has been excluded after 24 hours of admission. The patients with pneumonia who had human immunodeficiency virus (HIV) infection, tuberculosis, and fungal infection were excluded from the study. Blood samples were withdrawn by using 5 ml disposable syringe and needle. Blood samples were collected into plain bulb for vitamin E & in heparin bulb for vitamin C. The samples in plain bulb were allowed to clot for half an hour followed by centrifugation for 15 min at 2000 rpm.

The vitamin E was measured by Baker & Frank Myhod-1968. [5] In this method, serum vitamin E (tocopherol) can be measured by their reduction of ferric to ferrous ions which then form a red complex with α,α'-dipyridyl. Tocopherol and carotene were first extracted into xylene and absorbance was read at 460 nm to measure carotene. A correction for carotene was made after adding ferric chloride and was read at 520 nm.

The plasma vitamin C was measured by DNPH method [6] in which (ascorbic acid) vitamin C was oxidized & further converted to diketogulonic acid in strong acid solution. It further forms a diphenylhydrazone by reaction with 2,4-dinitrophenyl hydrazone. Hydrazole dissolves in strong sulphuric acid solution to produce red colored complex measured spectrophotometrically. This method measures both ascorbic acid & dihydroascorbic acid. However, as very little dihydroascorbic acid exists in blood, so it provides substantially the same results.

All the values obtained were expressed as mean ± SD. Student 't' test was applied to compare the difference in means between control and study groups. The difference were considered as highly significant if 'p' value was <0.001.

Results

The results shown in the Table 1 indicated a highly significant difference between the means of vitamin E and vitamin C between study group and control group.

The levels of vitamin E and vitamin C were found to be low in the study group (patients) as compared to control group which are highly significant. Also the ratio of vitamin E to vitamin C was higher in patients with pneumonia than the control group as shown in Table 2.

***Table 1**. Levels of vitamin E & vitamin C in the patients with pneumonia and Control group.*

Parameters	Patients (study group)	Control group	Level of significance
Vitamin E (mean ± SD)	5.43±2.07	13.53±1.1	P<0.001
Vitamin C (mean ± SD)	0.40±0.12	1.18±0.27	P<0.001

***Table 2.** The ratio of vitamin E to vitamin C in controls an patients from Pneumonia.*

Study group	Vitamin E/ vitamin C
Controls	11.46
Patients	13.57

Discussion

The pulmonary system, as its direct contact with the external environment is mainly exposed to a variety of noxious agents e.g. bacteria, which are the major cause of pneumonia. Phagocytic burst, an essential part of the defence system, results in large production of reactive oxygen species. [7]

The involvement of oxygen free radicals has been associated with a no. of pulmonary diseases such as acute respiratory distress syndrome (ARDS), bronchopneumonic dysplasia, emphysema, pneumocononiosis, hyperoxia, bleomycin toxicity, cystic fibrosis or bronchial asthma. The source of oxidants varies considerably for each specific case.

Oxygen free radicals are by products of normal aerobic metabolism. They are inactivated by antioxidant mechanisms which includes enzymes such as superoxide dismutase, catalase, glutathione peroxidase & others such as albumin, uric acid, lactoferrin, β-carotene, vitamin C & vitamin E. [7]

Imbalance between oxidant and antioxidants establishes cellular damage and pathophysiological disorder. Increased generation of ROS in vivo can lead to the depletion of one or more antioxidants. Loss of individual antioxidants (e.g. ascorbate or glutathione) can be measured as an index of oxidative stress. [8]

During pneumonia, a massive influx of activated phagocytes into the lower airways is observed. These cells are the first line of defence against invading microorganisms. Polymorphonuclear neutrophils and macrophages kill these microorganisms by using ROS, lysosomal enzymes including proteinases and antibiotic proteins. Increased oxidative stress in blood has been reported in patients with pneumonia. [9]

In the present study we observed the significant fall in the levels of antioxidants vitamin E & vitamin C in pneumonia patients than in controls. These results are similar to those of Cemek, Caksen et al (2006) [10] They observed that the vitamin C and E levels were lower in the study group compared with control group. All antioxidant vitamin activities were decreased in acute pneumonia. The study demonstrated that oxidative stress was increased whereas enzymatic and non-enzymatic antioxidant activities were significantly lower in children with pneumonia.

Raghunath R Rai and Madhavi S. Phadke (2006) [11] also confirmed the fact that in different respiratory disorders the status of plasma oxidants and antioxidants vitamin C & vitamin E showed decreased levels than in controls. Similar results were reported by K. Katsoulis et al (2005) [7] and Suzy A. A. Comhair et al (2002) [12] The results of K. Katsoulis et al showed decreased serum total antioxidant status in patients with pneumonia, indicating the presence of oxidant/antioxidant imbalance, probably due to the increased oxidative load.

Earlier it was hypothesized that the alveolar space can recruit additional antioxidant activity from epithelial lining fluid [12]. The multiplicity of the antioxidant system available to the lung and their overlapping specific activities suggest that to maintain pulmonary cellular function, it is critically important for the lung to adequately control redox balance. Disequilibrium either through increased oxidant stress or decreased antioxidant resources can result in the lungs that culminate in cellular death and pulmonary dysfunction.

Thus all the results in the present study, when taken together suggested the lowered activity of vitamin E & vitamin C may be due to the oxidant-antioxidant imbalance and increased oxidative stress. As oxidant-antioxidant

balance is essential for the normal lung function, the imbalance between oxidant-antioxidant may lead to lung injury. This disequilibrium may cause pathophysiological changes in the lung that culminate in the cellular death and pulmonary dysfunction either through increased oxidative stress or decreased antioxidant resources.

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ROLE OF LACTATE DEHYDROGENASE ACTIVITY IN- CATARACTOGENESIS

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ABSTRACT

Glycolysis an anaerobic process involving the participation of a number of enzymes and coenzymes is the main route by which glucose is metabolised by an eye lens to serve as the chief source of energy. Amongst them Lactate dehydrogenase (LDH) is an important enzyme. distributed throughout human tissues and is also present in plasma Cerebrospinal fluid and serous effusions.
Although Lens LDH activity was not related to serum LDH activity. A gradual decrease in total LDH activity in the lens with an advancement of cataract was observed. The maximum reduced LDH activity was observed in hypermature senile cataract.

Key Words - Eye, Cataractogenesis, lactate dehydrogenase.

INTRODUCTION

Biomedical investigation helps us to understand the chemical pathology of many diseases, in which significant chemical changes occur in the body. Eye is an important organ of the body and blindness is the major health problem among opthalmic disorders in India Generally cataracts, retinoblastoma glaucoma, uveitis are some of opthalmic disorders leading to blindness. There are several factors causing blindness.

Cataract is the major cause of blindness and it can be defined broadly as any lens opacity on or inside the lens. The state of biochemical parameters such as lens proteins, lipid peroxide, super oxide 'd' ismutase, lipids, LDH etc., are important variables in cataract formation. Lens opacipation has been both theoretically and experimentally shown to be correlated with changes in the state of above biochemical in cataract research can provide explanations for lens opacity and information regarding the mechanism involved in the cataractogenesis.

In order to understand the biochemical basis of cataract formation, the present study was carried out to determine the changes in lactate dehydrogenase activity in senile cataractous lenses.

The LDH is distributed throughout human tissues plasma CSF and serous effusions (Dias *et al.* 1971). Nagpal *et al.* (1991) have noted the lowered activity of total LDH in mature cataractous lenses. However, the decrease was gradual, depending up on the maturity of

n = indicates number of cases stuidied, values are expressed as Mean ± SD

* = P < 0.001, # P> 0.05

CONCLUSION

The gradual decrease in total LDH activity in the lens with on advancement of cataract was obseved. The maximum reduction in LDH activity was observed in hypermature senile cataract while serum LDH activity was found to be within normal limits.

DISCUSSION

During recent years, the thrust areas of in ophthalmic sciences continued to be cataract. In order to understand the biochemical basis of cataract formation, the present study was carried out to determine the changes in LDH activity in senile cataractous lenses.

Present study has indicated declined values of lense LDH activity, whereas serum LDH levels were not altered in individuals with cataract. This indicates that significant dedrease in lens LDH activity did not bear any relationship to LDH in serum.

The declined levels of lens LDH activity were to the extent of 21.69%, 38.23%, 53.9% in immature, mature and hypermature senile cataract as compared to control. Similar observations were made by Chadha *et al.* (1981) Nagpal *et al.* (1991) Maraini *et al.* (1967) and Bulakh *et al.* (1985).

Chadha *et al.* (1981), studied the LDH activity in patients with cataract and observed that total LDH activity was lowered in all types of cataract of all ages. The maximum lowering of LDH activity has been shown in hypermature cataract.

Thus, the gradual decrease in total LDH activity in the lens was maximum in hypermatursenile cataract (Table.1).

The decrease in LDH activity may be due to a leakage of the enzyme along with the other soluble proteins, following the post-cataractous breakdown of lens fibers. The changes noted in LDH activity in cataract lenses may lead to increase in lactic acid, resuling in a change in PH, which might be partly responsible for the precipitation of proteins present in the lens causing opalescence in cataract lens.

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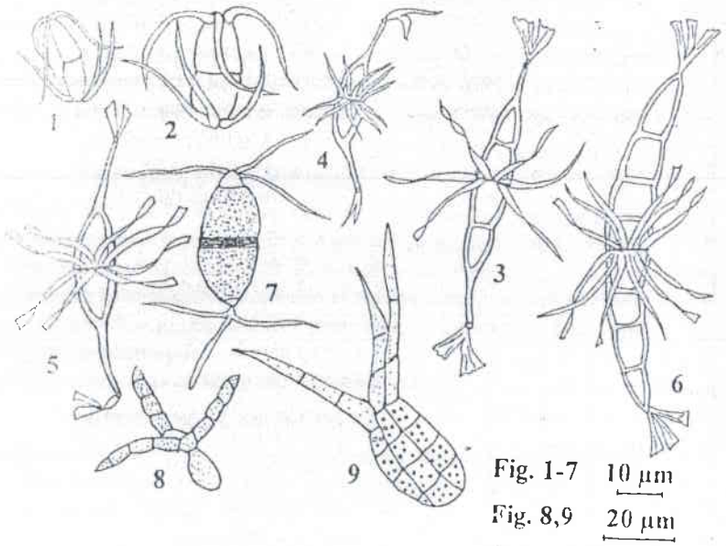

Figure legend

1. *Arenariomyces parvulus*
2. *Arenariomyces trifurcatus*
3. *Corollospora angusta*
4. *Corollospora cinnamomea*
5. *Corollospora maritima*
6. *Corollospora pulchella*
7. *Savoryella appendiculata*
8. *Clavatospora bulbosa*
9. *Tetraploa aristata*

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CHANGES IN SERUM CHOLESTEROL, TRIGLYCERIDIES AND PHOSPHOLIPIDS IN MANIA PATIENTS WITH AND WITHOUT LITHIUM THERAPY

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ABSTRACT

In the present study serum total cholesterol, triglycerides and phospholipids were estimated from 47 cases of mania patients, out of which patient 25 and 22 were on lithium and without lithium therapy. respectively. observed values were compared with 26 normal healthy individuals of relatively identical age group. It is observed that in both groups of mania patients, levels of serum cholesterol, triglycerides and phospholipids decereased compared to the normal.
The triglyceide levels wer e eignificantly decreased in lithium treated mania patients. The observed low values can be explained as lithium effects the turn over of lipids by deposition of lipids as depot fats.

Key words - Serum cholesteroles, triglycerides, Phospholipids, mania patients, lithium therapy.

INTRODUCTION

Lithium is the lightest of all the alkali metals. It belongs to I-a group in periodic table. The salts of this monovalent cation share some characteristics with those of sodium and potassium. It is the modern psychotropic drug. Its efficiency in the treatment of mania was discovered by an Australian psychiatrist John Cade (1949). He reported that dose of lithium citrate claimed extreme excitability in acute mania cases since then Lithium has gained widespread acceptance as a treatment for acute mania.

Lithium carbonate is the drug of choice now for patients with manic depressive illness. (Baastrup and Schou, 1967). It is also used to alcoholisum, movemment behaviour, personality disturbances as well as mood disorders associated with pre menstrual tension.

As yet, no pathogenetic mechanism of this disorder is known and no single mechanism Schatzberg and Cole, 1991 has been accepted as an explanation for the therapeutic effects of lithium in it. (Schatzbera and Cole, 1991). It is reported that it interacts with cell membranes to increase permeability, alters the tonic composition of water in the body and relationship between sodium and potassium (Frenkel. *et al.*1970).

Lithium causes decreased release and increased uptake of nor epinephrine, which is

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SOME ADDITIONS TO ASCOMYCETOUS MYCOFLORA OF MAHARASHTRA-I

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ABSTRACT

Three ascomycetous lignicolous fungi have been described and illustrated here. All are new additions to the mycoflora of Maharashtra State, Viz., *Peroneutypa heteracantha* (Sacc.)Berlese, *Rosellinia indica* Dargan and Thind, *R. sublimata* (Dur. and Mont.) Pass.

Key Words : Ascomycetes, Taxonomical study, Mycoflora, Maharashtra.

INTRODUCTION

The present paper deals with the taxonomical study of lignicolous ascomycetous fungi. During visits to different forest areas of North-Maharashtra, author encountered many interesting fungi. After a critical survey of literature (Bilgrami *et al.* 1979, 1981, 1991; Bhide *et al.* 1987; Kamat *et al.*1971), the fungi reported in this paper are found to be the new additions to the mycoflora of Maharashtra state.

MATERIALS AND METHODS

The material was collected by frequent visits to the different localities of forests from North Maharashtra during diffierent seasons. The stromatic forms were collected on dead twigs. The freehand sections of stromatic forms passing through the host tissue were taken. The temporary micropreparations were stained by cotton blue, Melzer's reagent and mounted in lactophenol. They were sealed with D.P.X. while the dried herbaria were prepared for deposition. For identification recent literature was followed. The specimens were deposited in Imperial Mycological Institute, Kew, England under the code IMI.

RESULTS AND DISCUSSION

1. *Peroneutypa heteracantha* (Sacc.) Berlese
   Icones Fung. 3:80, 1902.

Stroma in the wood or bark and causing somewhat blackening of the surface;perithecia innate, developed on the corterx below the bark and exposed by cracking of the bark through which long, slender, smooth, cylindrical, straight or curved black beaks coming out, 62.5 -